TANTA UNIVERSITY
DEPARTMENT OF COMMUNICATIONS
ELECTRONIC CIRCUITS & MEASUREMENTS
FIRST TERM EXAM

FACULTY OF ENGINEERING
1ST SEMSTER, 2ND YEAR, 20-1-2014
TIME: 3 HOURS
TOTAL MARKS: 85

Answer the following questions

Question (1)

(a) Explain -with draw- what is meant by (Negative Feedback Amplifier)? (5)

(b) State the PROS and CONS of the Feedback amplifiers. (5)

(c) An amplifier has a voltage gain of 100 and its voltage gain is increased to 200 by increasing the bias conditions. Calculate the negative feedback factor that must be applied to bring the voltage gain to the original value 100. (7)

Question (2)

(a) Explain (with DRAW) how the Hartley oscillator works. (5)

(b) What are the required conditions to sustain the oscillation of the oscillators, and what will happen if one of them is not fulfilled? (5)

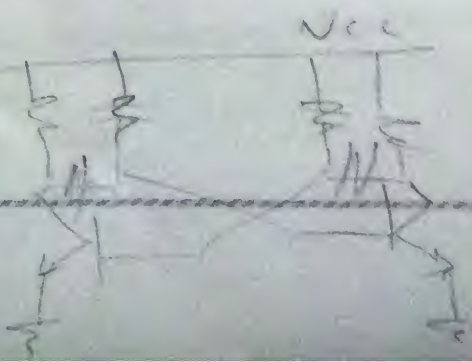
(c) A Colpitts Oscillator circuit having two capacitors of 10 pF and 100 pF respectively are connected in parallel with an inductor of 10 mH. Determine the frequency of oscillations of the circuit. (7)

Question (3)

(a) Explain (with DRAW) the principle of operation of Basic BJT astable multivibrator. (6)

(b) What is meant by (Schmitt trigger)? Draw its symbol and the two-transistor Schmitt trigger circuit. (6)

(c) Compare between the different types of multivibrator. (5)



Question (4)

(a) State the most important parameters that define the performance of the RF power amplifier. (5)

(b) For a class B amplifier providing a 20 V peak signal to a 16 Ω load (speaker) and a power supply of V_{CC} = 30 V, determine the input power, output power, and circuit efficiency. (6)

(c) Calculate the efficiency of a transformer-coupled class A amplifier for a supply of 12 V and outputs of :

(i) V (p) = 12 V.

(ii) V (p) = 6 V.

(iii) V (p) = 2 V. (6)

Question (5)

(a) State the four different types of ac voltage controllers. (5)

(b) State 4 applications of AC Voltage Controllers. (4)

(c) A single phase full wave ac voltage controller working on ON-OFF control technique has supply voltage of 230 V, RMS 50 Hz, load = 50 Ω. The controller is ON for 30 cycles and off for 40 cycles. Calculate: (8)

(i) ON & OFF time intervals.

(ii) RMS output voltage.

(iii) Input P.F.

(iv) Average and RMS thyristor currents.

WITH BEST WISHES

Dr. Mohamed Salah